

REMARKS

Claims 1-13 and 15 are pending in the application. Claims 9-13 and 15 have been withdrawn as being directed to a non-elected invention. New claim 16 has been added to the application. Therefore, claims 1-8 and 16 are at issue.

Claim 1 has been amended to correct an obvious error by reintroducing the term "particles" into the claim. The term "particles" is present in the original claim 1 and was inadvertently omitted in the preliminary amendment of April 25, 2006. Original claim 1 serves as support for this amendment.

Claim 1 also has been amended to recite that the solvent of general formula (I) has an integer "n" from 1 to 5. Claim 1 now recites that the solvent is a monoalkoxylated glycol. Support can be found in claim 3.

Support for new claim 16 can be found in original claims 10 and 13 and in the specification at page 6, lines 24 and 25.

The present claims are directed to absorbent polymeric *particles*, optionally surface crosslinked, and coated with each of (a) a surfactant and (b) a solvent having one hydroxy group, i.e., a monoalkoxylated glycerol, such as the monobutyl ether of diethylene glycol. The absorbent polymeric particles are capable of absorbing blood and body fluids.

Claims 1 and 3-8 stand rejected under 35 U.S.C. §102(e) as being anticipated by Smith et al. U.S. Patent Publication No. 2007/0167560 ('560 publication). The basis of the rejection is that the '560 publication discloses a superabsorbent polymer post-treated with aluminum oxide, aluminum sulfate, an amphoteric surfactant, and a glycol ether, thereby anticipating claims 1 and 3-8. Applicants traverse this rejection.

With respect to a rejection under 35 U.S.C. §102, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). A determination that a claim is anticipated under 35 U.S.C. §102 involves two analytical steps. First, the Patent Office must interpret the claim

language, where necessary, to ascertain its meaning and scope. In interpreting the claim language, the Patent Office is permitted to attribute to the claims only their broadest *reasonable* meaning as understood by persons having ordinary skill in the art, considered in view of the entire disclosure of the specification. See *In re Buszard*, 504 F.3d 1364 (Fed. Cir. 2007) (reversing a Patent Office decision that applied an unreasonably broad interpretation to a claim); see also *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). Second, the Patent Office must compare the construed claim to a single prior art reference and set forth factual findings that "each and every limitation is found either expressly or inherently [disclosed] in [that] single prior art reference." *Celeritas Techs. Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998). Additionally, "[t]he identical invention must be shown in as complete detail as is contained in the patent claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

With further respect to a rejection under 35 U.S.C. §102, MPEP §2131 states:

"TO ANTICIPATE A CLAIM, THE REFERENCE MUST
TEACH EVERY ELEMENT OF THE CLAIM

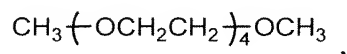
'A claim is anticipated only if each and every elements as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)... 'The identical invention must be shown in as complete detail as is contained in the...claim.' *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."

The examiner relies upon paragraph [0109], Example 16, of the '560 publication to support the rejection. In this paragraph, a crosslinked, absorbent polymer has alumina, aluminum sulfate, disodium cocoamphopropionate, ethylene carbonate, and tetraethyleneglycol dimethyl ether sprayed onto polymer particles. The resulting particles then are heated for 20 minutes at 180°C.

The '560 publication therefore teaches surface crosslinked polymer particles. See paragraph [0031] of the '560 publication, wherein particles are coated with an alkylene carbonate, followed by heating. The alkylene carbonate is distributed evenly over the particles (paragraph [0032]), followed by a thermal treatment (paragraph [0033]). The surface crosslinked particles also contain a penetration modifier, such as tetraethyleneglycol dimethyl ether, for the surface crosslinking agent.

The '560 publication cannot anticipate present claims 1 and 3-8 because differences exist between the '560 publication and the present claims.

First, the present claims require a solvent of general formula (I), which must contain *one* hydroxy (-OH) group. Tetraethyleneglycol dimethyl ether has a structural formula:



which lacks a hydroxy group. For this reason alone, the '560 publication cannot anticipate claims 1 and 3-8, or new claim 16.

In addition, the disclosure in paragraph [0109] of the '560 publication is directed to surface crosslinking. Claim 7 recites that the particles are free of postcrosslinking, which is synonymous to surface crosslinking. Also, see claim 8 wherein not less than 20%, i.e., greater than 20%, of the particles are *free* of postcrosslinking. The '560 publication distributes the surface crosslinking solution evenly on the particles (paragraph [0032]), which means that *all* particles are postcrosslinked. Thus, an independent reason exists as to why claims 7 and 8 are not anticipated by the '560 publication.

Because differences exist between present claims 1 and 3-8 (and new claim 16) and the '560 publication, a rejection of these claims under 35 U.S.C. §102(e) cannot be maintained. In addition, it is submitted that claims 1, 3-8, and 16 would not have been obvious over the '560 publication under 35 U.S.C. §103.

A determination that a claimed invention would have been obvious under §103(a) is a legal conclusion involving four factual inquiries: (1) the scope and content of the

prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations, if any, of non-obviousness. *Graham vs. John Deere Co.*, 383 U.S. 1, 17-18 (1966). Obviousness must be determined as of the time the invention was made and in view of the state of the art that existed at that time. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050-1051 (Fed. Cir. 1988).

Furthermore, to establish a prima facie case of obviousness, the examiner must satisfy three requirements. First, the prior art references must teach or suggest all the limitations of the claims. In *re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970). Second, as the U.S. Supreme Court held in *KSR International Co. v. Teleflex Inc. et al.*, 127 S.Ct. 1727 (2007), "a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. ...it [may] be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was *an apparent reason* to combine the known elements in the fashion claimed by the patent at issue. ...it can be important to *identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements* in the way the claimed new invention does... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." (emphasis added, *KSR, supra*). Lastly, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *Amgen Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991).

The particulate polymers of the '560 publication are surface crosslinked requiring use of a surface crosslinking agent and optional ingredients, including a penetration modifier, a multivalent metal salt, and a surfactant (see paragraphs [0013]-[0015] and [0030]). Paragraph [0010] of the '560 publication teaches that it is the "new surface modifications" of the publication that provide the desired improved gel permeabilities.

In contrast to the '560 publication, the claimed polymeric particles are coated with a solvent having one hydroxy group. The '560 publication fails to teach a coating containing a claimed solvent, but only a penetration enhancer, like tetraethyleneglycol dimethyl ether, which fails to contain a hydroxy group. Another preferred penetration enhancer is a polyethylene glycol, which contains two hydroxy groups ('560 publication, [0035].

Because the '560 publication fails to teach or suggest every claimed element, a contention of *prima facie* obviousness cannot be maintained. In addition, because the '560 publication requires surface crosslinking of the particles, claims 7 and 8 cannot be *prima facie* over the '560 publication. The omission of surface crosslinking destroys the teaching of the '560 publication. The '560 publication provides no apparent reason to omit surface crosslinking, with any reasonable expectation of providing polymer particles having the high blood absorbing properties recited in claim 6.

For the reasons set forth above, it is submitted that claims 1, 3-8, and 16 are neither anticipated by, nor obvious over, the '560 publication, and that the rejection should be withdrawn.

Claims 1, 2, and 6-8 stand rejected under 35 U.S.C. §102(a) as being anticipated by Birkel et al. U.S. Patent Publication 2003/0035783 ('783 publication). It is submitted that this rejection has been overcome, and should be withdrawn.

In particular, claim 3 was not included in this rejection. Claim 1 has been amended to incorporate the features of claim 3, wherein "n" of the solvent is now 1 to 3. Accordingly, the rejection of claims 1, 2, and 6-8 as being anticipated by the '783 publication should be withdrawn.

It should further be noted that the '783 publication is directed to a cosmetic agent in the form of a gel. In Example 2 relied upon by the examiner, a hair gel was prepared by swelling a superabsorbent polymer (0.7 g) with excess water (68.8 g). The result of Example 2 is an aqueous gel because the superabsorbent polymer is swelled by the large amount of water. The present claims are directed to polymeric particles. The '783

publication fails to disclose coated particles. Further, and as recognized by the examiner, the '783 publication fails to disclose any coating with multivalent metal cations.

In summary, it is submitted that the rejection of claims 1, 2, and 6-8 over the '783 publication should be withdrawn. It is further submitted that new claim 16 is patentable over the '783 publication.

Claims 1-4 and 6-8 stand rejected under 35 U.S.C. §103 as being obvious over Gartner et al. U.S. Patent No. 6,916,864 ('864). The examiner contends that the present claims would have been obvious because a polymer of the '864 patent can be treated with inversion agents, like nonionic surfactants, glycol ethers, and titanium dioxide. Applicants traverse this rejection.

The '864 patent discloses high internal phase polyelectrolyte emulsions used in the production of superabsorbent polymers (SAPs). The emulsions typically are stabilized using an emulsion surfactant (column 4, lines 49 to 53). The '864 patent also discloses a process for inverting water-in-oil emulsions (column 3, lines 12 to 18).

The '864 patent discloses five different techniques to accomplish such an inversion, starting at column 16, line 14. Technique 4) is the addition of so-called LCST solvents (column 16, line 65). Such solvents may be solvents of general formula I of present claim 1 (column 9, lines 48 to 52). Technique 5) is the addition of metal oxides, such as titanium oxide (column 17, lines 11 to 15).

It is readily seen that techniques 4) and 5) of the '864 patent are separate *and* independent techniques. Because the addition of an LCST solvent and the addition of metal oxides belong to different inversion techniques, no reason exists to combine such different techniques.

A person skilled in the art would have had no apparent reason or incentive to use both techniques 4) and 5), and the '864 patent provides no incentive to use both methods when any of techniques 1) through 5) is sufficient alone. The examiner has failed to provide any reason that would have prompted a person skilled in the art to combine techniques 4) and 5) and arrive at the presently claimed invention. Further, there is no teaching or suggestion of

success if the two techniques are combined. The '864 patent is silent with respect to combining *any* two of five disclosed techniques. Note, column 6, lines 8-17, of the '864 patent wherein the five techniques are presented in the alternative, i.e., "or".

With further respect to technique 5) of the '864 patent, this technique requires the application of metal oxide powders. The metal oxide powders disclosed in the '864 patent, i.e., titanium dioxide, and fumed silica, do *not* provide multivalent metal cations. The metal oxides are water insoluble and the metal is tightly bound such that the metallic cations are not available. This feature is more clearly set out in new claim 16, wherein the multivalent metal cation is applied as an aqueous *solution*. The metal oxides of the '864 patent are insoluble, and cannot form a solution. Further, any application of a solid metal oxide rather than a metal cation, particularly in solution, provides a distribution of the metal oxide on a particle different from a distribution of a soluble metal cation on a particle.

In summary, the polymer resulting from the '864 patent and the presently claimed particles differ both in identity (metal oxide vs. metal cation) and distribution of the metal oxide/metal cation on a particle surface.

It should further be noted that the LCST solvent or metal oxide are used to invert an emulsion. The '864 patent fails to teach or suggest whether the LCST solvent or metal oxide is present on the resulting polymer or not. In addition, the '864 patent is not directed to particles, but to films and "other patterns" ('864 patent, abstract).

Accordingly, for all the reasons set forth above, it is submitted that a person skilled in the art would have no apparent reason to combine separate and independent techniques disclosed in the '864 patent to invert an emulsion, and let alone substitute metal cation for a metal oxide, with any reasonable expectation of providing polymer particles having an improved ability to absorb blood and body fluid.

Claims 1-6 stand rejected under 35 U.S.C. §103 as being obvious over Smith et al. U.S. Patent Publication No. 2007/0254177 ('177 publication). The rejection is based on the disclosure of the '177 publication with respect to postcrosslinking with a nonionic surfactant, organic solvent (ethanol), and aluminum salt. Applicants traverse this rejection.

Paragraphs [0045], [0068], and [0069] of the '177 publication relied upon by the examiner disclose post-crosslinking of polymer particles. One post-crosslinking agent can be an aluminum salt (class IV crosslinker) and various polyfunctional materials listed in paragraph [0068]. Each hydroxy-containing compound in paragraph [0068] differs from a claimed solvent applied to the surface of the polymer particles. The solvents used in the post-crosslinking step of the '177 publication are listed in paragraph [0069], and include lower alcohols. These lower alcohols are different from the solvents recited in present claim 1. Furthermore, postcrosslinking is performed at 170°C (see [0153]), which evaporates the lower alcohols, such that no coating of lower alcohols remain on the particle surfaces.

Because the '177 publication fails to teach or suggest every element of the claimed invention, a case of *prima facie* obviousness of claims 1-6 and 16 over the '177 publication cannot be established. The '177 publication fails to teach or suggest a solvent as present claimed.

In addition, a person skilled in the art would have had no apparent reason to substitute a claimed solvent for the compounds listed in paragraphs [0068] and [0069] of the '177 publication. A claimed solvent cannot act as a post-crosslinking agent, as the compounds in paragraph [0068], and have a low vapor pressure and may not evaporate, as the compounds in paragraph [0069].

It also must be noted that the identity of the solvent effects the ability of a superabsorbent polymer particles to absorb body fluids. Note Table 3 of the specification at page 17. Examples 15 and 16 having DEGMBE applied to particle surfaces increased blood absorbance (BA) from about 5-8 g/g up to about 18-20 g/g. Just as surprisingly, the amount of 0.9% sodium chloride solution absorbed *decreases* (see FSC and CRC data). The claimed polymer particles therefore have a preference for absorbing blood over saline. Such results are unexpected and could not have been predicted from the '177 publication disclosure, or any of the other references cited against the present claims, each of which is directed to *increasing* the absorbance of saline (e.g., urine), i.e., seeking a high AUL and CRC.

It therefore is submitted that claims 1-6 and 16 would not have been obvious over the '177 publication under 35 U.S.C. §103 and that the present rejection should be withdrawn.

It further is submitted that all pending claims are in a form and condition for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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